



VALIDATION REPORT

ANGKOR BIO COGEN RICE HUSK POWER PROJECT IN CAMBODIA

REPORT NO. 2006-0559

REVISION NO. 01A

DET NORSKE VERITAS



VALIDATION REPORT

Date of first issue: 2006-04-04	Project No.: 28624552
Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: Mitsubishi UFJ Securities Co., Ltd.	Client ref.: Junji Hatano

DET NORSKE VERITAS AS

DNV Certification

Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
<http://www.dnv.com>
Org. No: NO 945 748 931 MVA

Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Angkor Bio Cogen Rice Husk Power Project” in Cambodia on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

The validation consisted of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

This report was updated reflecting the project design document of 31 July 2006 which was corrected and re-submitted by the project participant at the request of CDM Executive Board.

In summary, it is DNV’s opinion that the project, as described in the project design document of 31 July 2006, meets all relevant UNFCCC requirements for the CDM, is eligible as category I.A/III.E small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology AMS-I.A version 07 and III.E version 07. Hence, DNV requests the registration of the “Angkor Bio Cogen Rice Husk Power Project” as CDM project activity.

Report No.: 2006-0559		Subject Group: Environment	
Report title: Angkor Bio Cogen Rice Husk Power Project in Cambodia			
Work carried out by: Akira Sekine, DNV Japan Thivakaran Narayanan, DNV Malaysia			
Work verified by: Einar Telnes, DNV Norway			
Date of this revision: 2006-08-04	Rev. No.: 01a	Number of pages: 15	
<div> <div> Indexing terms </div> <div> Key words Climate Change Kyoto Protocol Validation Clean Development Mechanism </div> <div> Service Area Verification </div> <div> Market Sector Process Industry </div> </div>			
<input checked="" type="checkbox"/> No distribution without permission from the client or responsible organisational unit <input type="checkbox"/> free distribution within DNV after 3 years <input type="checkbox"/> Strictly confidential <input type="checkbox"/> Unrestricted distribution			
© 2002 Det Norske Veritas AS All rights reserved. This publication or parts thereof may not be reproduced or transmitted in any form or by any means, including photocopying or recording, without the prior written consent of Det Norske Veritas AS.			



<i>Table of Content</i>	<i>Page</i>
1 INTRODUCTION	1
1.1 Validation Objective	1
1.2 Scope	1
1.3 Description of Proposed CDM Project	1
2 VALIDATION METHODOLOGY	2
2.1 Review of Documents	4
2.2 Follow-up Interviews	4
2.3 Resolution of Clarification and Corrective Action Requests	5
3 VALIDATION FINDINGS	5
3.1 Participation Requirements	6
3.2 Project Design	6
3.3 Project Baseline	6
3.4 Additionality	7
3.5 Monitoring Plan	7
3.6 Calculation of GHG Emissions	7
3.7 Comments by Local Stakeholders	8
4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS	8
5 VALIDATION OPINION	13
REFERENCES.....	15
Appendix A Validation Protocol	

***Abbreviations***

ABC	Angkor Bio Cogen Co., Ltd.
ARM	Angkor Kasekam Roongroeung Co., Ltd.
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

Mitsubishi UFJ Securities Co., Ltd. has commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the Angkor Bio Cogen Rice Husk Power Project (hereafter called “the project”) in Cambodia. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for small-scale CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

This report was updated reflecting the project design document of 31 July 2006 which was corrected and re-submitted by the project participant at the request of CDM Executive Board.

The validation team consists of the following personnel:

Mr. Akira Sekine	DNV Certification Japan	Team Leader, GHG Auditor
Mr. Thivakaran Narayanan	DNV Certification Malaysia	GHG Auditor
Mr. Einar Telnes	DNV Certification Norway	Technical Verifier

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against Kyoto Protocol criteria for the CDM, the CDM rules and modalities as agreed in the Marrakech Accords (the simplified modalities and procedures for small-scale CDM project activities) and relevant decisions by the CDM Executive Board (including the approved methodologies you have used).

The validation is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the of the project design.

1.3 Description of Proposed CDM Project

The purpose of the project activity is to generate electricity utilizing rice husk by-produced by rice mill as fuel. Angkor Bio Cogen Co., Ltd. (ABC), a special purpose company for the rice husk power generation project will construct a power plant with a generation capacity of 2.0 MW in Phum Ang Snoul, Ang Snoul District, Kandal in Cambodia. The generated electricity will be sold to the adjacent rice mill owned and operated by Angkor Kasekam Roongroeng Co., Ltd. (ARM) which supplies the rice husk to ABC and to the neighbouring factory via ARM.

ARM and ABC are exploring a possibility of providing a small volume of the electricity to the Ang Snoul Village, which is not currently electrified. However, this activity is not included in the small-scale CDM project proposed by the PDD. Approximately 10% of the steam generated



by the rice husk fired boiler will be consumed for drying rice paddy. However, this is also not included in the small-scale CDM project.

ABC will claim the credit of 51 620 tCO₂e annually between 2007-2014 (7 years) by avoiding CH₄ generation/emission by means of combustion of waste instead of piling this to decay, and by displacing electricity currently generated by diesel oil. The project proponent intends to seek approval for 2 subsequent crediting periods as applicable.

2 VALIDATION METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design documentation
- II follow-up interviews with Angkor Bio Cogen Co., Ltd, Mitsubishi UFJ Securities Co., Ltd. and other relevant project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a determination protocol was customised and used for the project, according to the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirement), means of verification and the results from validating the identified criteria. The validation protocol serves the following purpose:

- It organises, details and clarifies the requirements a small-scale CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the results of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective Action Requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term Clarification (CL) may be used where additional information is needed to fully clarify an issue.

The validation protocol for the “*Angkor Bio Cogen Rice Husk Power Project*” is enclosed in Appendix A to this report.



Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	Reference	Conclusion	Cross reference
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A request for Clarification (CL) is used when the validation team has identified a need for further clarification.</i>

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation protocol tables



2.1 Review of Documents

The original project design documents (PDD) of 16 February 2005 /1/ and 12 April 2005 /2/ submitted by Mitsubishi UFJ Securities and additional background documents related to the project design and baseline were reviewed;

Following the interviews with project stakeholders, Mitsubishi UFJ Securities revised the PDD to address the issues identified by DNV during the desk review as well as the public comment received.

A revised project design document was submitted on 27 March 2006 /3/. This version was submitted for registration. The request for registration received requests for review by four members of the CDM Executive Board. After considering the requests for reviews and the project participants' and DNV's initial response to the issues raised in the requests for review, the Board agreed to register the project if the project participant submit a revised PDD that ensures that the quantity of electricity supplied to the local community is included in the monitoring plan, and is subtracted from the electricity generated in order to calculate the emission reductions, and that address the editorial issues raised in the requests for review. The project participants thus submitted a further revised PDD on 31 July 2006 /4/ to address the Board's requests.

2.2 Follow-up Interviews

In the period of 02-03 February 2005, a member of the validation team from DNV performed interviews with project stakeholders in Cambodia to confirm selected information and to resolve issues identified in the document review. Representatives of Mitsubishi UFJ Securities were also interviewed. The main topics of the interviews are summarised in Table 1

Table 1 Interview topics

Interviewed organisation	Interview topics
Mitsubishi UFJ Securities Co., Ltd.	<ul style="list-style-type: none"> ➤ Baseline determination ➤ Project barrier ➤ Monitoring and measurement
Angkor Bio Cogen Co., Ltd. (Angkor Kasekam Roongroeung Co., Ltd.)	<ul style="list-style-type: none"> ➤ Status of project management planning ➤ Storage condition of waste ➤ Stakeholder consultation
Ministry of Environment(DNA of Cambodia)	<ul style="list-style-type: none"> ➤ Project endorsement ➤ Contribution to Sustainable Development ➤ Environmental issues
Ministry of Industry Mines and Energy (MIME)	<ul style="list-style-type: none"> ➤ Renewable energy circumstance ➤ Rural electrification
The Cambodian Research Centre for Development	<ul style="list-style-type: none"> ➤ Power sector expansion plan



2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve requests for corrective actions and clarification and any other outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. All of the Corrective Action Request and Clarification Requests identified by DNV were resolved through communications between Mitsubishi UFJ Securities and DNV. To guarantee the transparency of the validation process, the concerns raised and responses given are summarised in chapter 3 below and documented in more detail in the validation protocol in Appendix A.

Since modifications to the project design were necessary to resolve DNV's concerns, Mitsubishi UFJ Securities decided to revise the documentation and resubmitted project documentation on 12 April 2005. This project design document was published for public comments from 15 June 2005 to 14 July 2005. After getting the approval of the host country, the project design document was revised reflecting the public comment received and resubmitted the project documentation on 27 March 2006. After reviewing the revised PDD, DNV issued this final validation report and opinion. As a consequence of the request for review by four members of the CDM Executive Board, the project participants submitted a further revised PDD on 31 July 2006 /4/ to address the Board's requests.

3 VALIDATION FINDINGS

In the following sections the findings of the validation are stated. The validation findings for each validation subject are presented as follows:

- 1) The finding from the desk review of the original project design documents and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Validation Protocol in Appendix A.
- 2) Where DNV had identified issues that need clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in two (2) Corrective Action Requests and ten (10) Clarification Requests.
- 3) Where Clarification or Corrective Action Requests have been issued, the exchanges between Mitsubishi UFJ Securities and DNV to resolve these Clarification or Corrective Action Requests are summarised.
- 4) The final conclusions for validation subject are presented.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.



3.1 Participation Requirements

The project participant is Angkor Bio Cogen Co., Ltd. (Cambodia).

The Government of Cambodia ratified the Kyoto Protocol on 22 August 2002 and tentatively designated the Ministry of Environment, Climate Change Office as a focal point of CDM in July 2003.

The project was approved as a small-scale CDM project on 19 January 2006.

3.2 Project Design

Angkor Bio Cogen Co., Ltd. (ABC) is a special purpose company established for the rice husk power generation project in Cambodia established in August 2004. ABC is aiming to reduce GHG emission by means of avoiding CH₄ generation from decayed rice husk and utilizing it as biomass fuel for power generation as a small-scale CDM project, the “Angkor Bio Cogen Rice Husk Power Project”. In the project, ABC will construct a boiler/turbine power plant with a generation capacity of 2.0 MW by firing 33,419 tonnes of rice husk annually. This will result in a supply of 13,464 MWh/yrs. electricity generated to an adjacent rice mill owned and operated by Angkor Kasekam Roongroeng Co., Ltd.

The project is expected to contribute to sustainable development of Cambodia by improvement of the environment through prevention of uncontrolled piling of rice husk left to decay and rural electrification of a neighbouring village. It is confirmed through an interview with Cambodian DNA that the project is in line with the SD policy of Cambodia.

For the above reason, Cambodian DNA is supportive to the project.

The project doesn't involve public funding from countries listed in Annex I.

An operational lifetime of the project is supposed to be more than twenty one (21) years and the project participants chose “renewable crediting period” with the first crediting period of seven (7) years.

3.3 Project Baseline

The project selected to apply the Type I.A, “Renewable electricity generation by the user” and Type III.E, “Methane avoidance” methodologies for small-scale CDM project activities. Rice husk to be by-produced at the rice mill which is otherwise kept in piles to decay and generates CH₄, is utilized as power generation fuel and the generated power will displace the electricity generated by diesel currently. Thus CH₄ and CO₂ emissions are expected to be reduced accordingly.

The power unit, a boiler and a steam turbine generator, to be implemented by the project is biomass fired 2.0 MW in capacity and therefore doesn't exceed the eligibility threshold of 15 MW for Type I.A projects: The boiler will emit CH₄ and N₂O equivalent to 3,729 tCO₂ annually by biomass combustion and therefore doesn't exceed the eligibility threshold of 15,000 tCO₂ for Type III.E. Thus the selection of the baseline methodologies is appropriate.

During the first renewable crediting period of seven years, 361,340 tCO₂ equivalent is expected to be reduced.



In case any surplus electricity is supplied to the neighbouring village through the newly developed mini-grid and used for claiming additional credits, another baseline should be discussed for the project activity.

3.4 Additionality

As the project is the first biomass power generation project in Cambodia, the technological barrier presented is deemed as reasonable for “biomass power generation” component. Besides, as there is no regulation for agricultural waste management in Cambodia, the rice mill will continue to leave rice husk outside its premises for natural decomposition. The barrier due to prevailing Cambodian practices presented is deemed reasonable for the “methane avoidance” component. Due to the existence of the above two barriers, the project activity is not likely to represent a likely baseline scenario, and emission reductions attributable to the project are hence likely to be additional to any that would occur in the absence of the project activity.

3.5 Monitoring Plan

The methodologies for estimating baseline and project GHG emissions are sufficiently described in the PDD and deemed appropriate. Similar to the baseline methodologies selected, the monitoring plan is in line with the monitoring methodologies (Type I.A and III.E) defined for small-scale CDM projects.

All indicators of importance for controlling and reporting of project performance are incorporated in the monitoring plan. The project emission indicators specified in the PDD are possible to monitor/measure technically.

For ex-post baseline determination, necessary data are defined in the monitoring plan. Monitoring uncertainties are well addressed, e.g. measurement of amount of biomass treated.

At the request of the CDM Executive Board, the monitoring plan was corrected to include the monitoring of the amount of electricity supplied to the local community and this amount will be subtracted from the electricity generated in order to calculate the emission reductions.

Leakage effects are not necessary to monitor according to the selected monitoring methodologies.

The frequency, responsibility and authority for registration, monitoring, measurement and reporting activities are defined and management and planning a future subject to be taken care of the person responsible to the project, the managing director of ABC.

3.6 Calculation of GHG Emissions

The project boundaries are defined in the PDD appropriately according to the selected SSC-CDM methodologies, Type I.A and Type III.E. All relevant emissions are properly accounted for including non-CO₂ GHG.

All of the formulae, factors and default values used are in line with the selected SSC-CDM methodologies and described in a transparent manner. Energy content of rice husk used for determining project emission is based on the test results obtained by the external laboratory. The average values of rice husk of the surface of the pile and inside of the pile are used for determination. The samples were analysed three times respectively in order to minimise measurement variation and are sufficient to demonstrate the stability of the data. The carbon



emission factor used for diesel generation displacement is IPCC default value of 0.9 kg CO₂-e/kWh as defined by the SSC CDM methodology Type I.A.

3.7 Comments by Local Stakeholders

The local stakeholder consultation was carried out properly according to the direction of Ministry of Environment and relevant government entities. A public consultation meeting was conducted on 18 September 2004 at Angkor Kasekam Roongroeung office inviting 22 participants those include rice mill employees and representative of the village and the commune on general aspect of the project. Another meeting was held on 23 February 2005 at the Peuk Commune Office inviting representative of 19 villages and 1174 households including Ang Snoul villagers on the issue of electricity provision.

All comments received were supportive to the project and due account was not necessary to be taken.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of *12 April 2005* was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 15 June 2005 to 14 July 2005.

One comment was received on 1 July 2005. The comment received was made publicly available on DNV's website and is, in unedited form, presented below. DNV has taken due account of this comment in its validation of the project.

Comment by: T, CRCD

Inserted on: 2005-07-01

Subject: Public Comments on PDD

Comment:

COMMENTS ON THE PROJECT DESIGN DOCUMENT OF "ANGKOR BIO COGEN RICE HUSK POWER PROJECT", Version 2005-04-12

Submitted to Det Norske Veritas on 1 July 2005

Author: Dr Thanakvaro T. De Lopez, Cambodian Research Centre for Development (CRCD)

A.2.1 Purpose of the Project Activity

The PDD states: "The Project will become the first renewable energy project to utilize biomass in Cambodia."

The previous statement is inexact. There are a number of micro initiatives utilising biomass to produce electricity, including gasifiers and biofuel presses. More accurately, the project would be the first of its kind to produce electricity through rice husk combustion in the Kingdom of Cambodia.

The PDD states: "There is a possibility that Angkor Rice Mill sell a small amount of surplus electricity to neighbouring factories and community."



The previous statement requires clarification. Will the project sell electricity to local people or not? If yes, under which conditions? These questions need to be answered clearly and without ambivalence. If the project proponents cannot commit to providing electricity to local people, then any mention of this should be entirely removed from the PDD.

A.2.2 Contribution to the sustainable development of the host country

The sustainable development Matrix used by the Cambodian DNA to assess the suitability of proposed CDM projects details a total of 24 criteria divided into four categories: (1) Environmental Protection and Improvement, (2) Enhancement of Income and Quality of Life, (3) Technology Transfer, and (4) Economic Benefits. The PDD fails to argue in a precise and concise manner how the project intends to contribute to the national sustainable development objectives of the Kingdom of Cambodia.

The statements of this section are generally vague, and are not supported or argued in any detail. It might have made more sense to seek the prior approval of the Cambodian DNA before initiating the validation process of the PDD.

A.4.2.1 Type and categories of project activity

The project developers have chosen categories I.A (Electricity generation by the user) and III.E (Methane avoidance) of the Simplified Modalities and Procedures for Small-Scale CDM Project Activities. If the project intends to sell electricity to surrounding villages and factories (pages 1 and 25), then the appropriate category would be I.D (Renewable electricity generation for a grid). Clearly, the choice of whether to sell electricity to other potential users or not, has an impact on the simplified modalities and procedures to be used.

A.4.3 Brief statement on how anthropogenic emissions of greenhouse gases (GHGs) by sources are to be reduced by the proposed CDM project activity

The units of CO₂e reductions have not been specified (tons).

B.3.1 Additionality

The PDD states: "The normal practise in Cambodia is to leave rice husk outside until it is naturally decomposed."

The previous statement is incorrect. Across Cambodia, the use and disposal of rice husk varies according to specific local social and environmental conditions. There is anecdotal evidence that some regions actually experience a rice husk deficit, which may be used by cottage industries (brick kilns, wine distilleries, noodle factories etc.) and rural households (cooking fuel). Have the project proponents conducted any social impact assessment of rice husk uses in the project area? If rice husk were made accessible to local people as a public goods would it still be left to decay?

The role of CDM in enabling the implementation of the project is not discussed. Would the project make economic sense without CDM? The PDD does not list investment barriers to show that the project would not have occurred anyway. Is the use of diesel generators a financially more viable alternative to the project activity? What are the economics of the project? Would the sale of ash by-products from combustion, as fertilizers, not allow for a relatively rapid payback?



F – Environmental Impacts

The PDD states: "An Environmental Impact Assessment (EIA) is not required for a power generation project less than 5 MW in capacity in Cambodia."

The previous statement is inaccurate. An EIA is not required for power generation projects, other than hydropower, of installed capacity inferior to 5 MW. Hydropower projects of installed capacity of 1MW or higher require an EIA.

The PDD states: "SO₂ emissions will be minimal. NO_x emissions will be maintained within the prevailing emission standards promulgated by MIME..."

The previous statement is inappropriate for the following reasons:

1. The Sub-Decree on Air Pollution Control and Noise Disturbance (2000) is the relevant legal text governing emissions of air pollutants in the Kingdom of Cambodia, and should be referred to by the project developers.
2. Pollution control does not fall under the jurisdiction of the Ministry of Industry, Mines and Energy (MIME), it is the purview of the Ministry of Environment (MOE). Chapter 3 of the Sub-Decree clearly states that the emission of pollutants and noise from immovable sources into the atmosphere requires a permit from the Ministry of Environment.
3. Annexes 1, 2 and 3 of the Sub-Decree respectively specify ambient air quality standards, maximum allowable concentrations of hazardous substances in ambient air and maximum allowable standards of pollution substances from immobile sources in ambient air. In particular, Annex 3 lists maximum levels of discharge for 65 substances, including sulphur dioxide and all categories of nitrogen oxides.

Similarly the Sub-Decree on Water Pollution Control regulates wastewater discharge and includes provisions for issuance of permits, inspections and effluent standards. Water pollution control is under the jurisdiction of the Ministry of Environment.

G. Stakeholder Comments

A single public consultation meeting of 24 participants, 11 of which were "employees of the rice mill" could not possibly reflect the opinions of local communities with regards to the proposed project:

1. the sample size is inadequate
2. villagers of different social strata were not systematically consulted
3. local authorities (village and commune chiefs) and rice mill managers were present at the meeting, which may have prevented villagers from expressing their opinions.

In most of Cambodia, access to electricity is available, whether in the form of mini-grids set up by Rural Electricity Entrepreneurs (REEs), or village battery charging stations. There is no national grid in the project area, but the PDD should clarify the point of whether villagers already have access to REEs or battery chargers. According to official government statistics, Ang Snoul numbers more than 17,000 households (National Institute of Statistics), which clearly makes it an urban area. Thus it would be surprising that local people do not have



access to any form of electricity at all.

The summary of comments received is simplistic. No stakeholder should expect "no negative comments on the project" (page 25), more likely that sustainable development benefits outweigh some of their costs and that negative impacts are fully mitigated.

In several instances throughout the PDD, it is stated that the project developers are merely "exploring a possibility" of providing electricity to surrounding villages (pages 1 & 2). Yet it appears that local people expect to have access "to lower price and reliable electricity that Angkor Rice Mill plans to provide" (page 25). There is clearly some misunderstanding among villagers.

Firstly, I would suggest that the project developers make a clear stance on whether they will actually provide electricity at competitive prices to local people or not. If the developers have not made this decision at this stage, then the PDD should not use the provision of electricity to local people as a planned and certain sustainable development benefit. More importantly, local people must not be misled into believing that it is an assured benefit if the project is implemented.

Secondly, I would suggest that the developers conduct a more systematic survey of resident populations through small focus groups or individual household surveys.

SUMMARY OF COMMENTS

If implemented, the proposed project would be the first CDM project to take place in the Kingdom of Cambodia. From a technical standpoint, it is innovative and progressive. However, the PDD, as is proposed, does not adequately make a case for national sustainable development benefits. This is all the more regrettable, as Angkor Kasekam Roongreugn is one of the larger, better-managed and successful Cambodian rice mills. It is also one of the few companies with a concern for indigenous rice varieties and organic farming. Yet, the PDD does not make any mention of these characteristics. The project clearly has some showcase potential for renewable energy technologies and investments in CDM in Cambodia. Thus, it is imperative that it be rigorously designed to maximise national sustainable development benefits. As it stands, the PDD only glosses over sustainable development in very general terms and contains a number of inaccuracies.

How DNV has considered the comment received in its validation:

The above comments are basically supportive to the project. The PDD was corrected and/or revised reflecting the comments received. Corrections/revisions are summarised in "List of comments and actions" /4/ and found appropriate as follows:

Comment on A.2. (former A.2.1)

The PP had revised the statement from "the first renewable energy project to utilize biomass..." to "utilize rice husk..." This is reasonable.

The PP had clarified that "the electricity supply to the neighbouring community is outside of the project boundary" by means of stakeholder communication.

Comment on A.2. (former A.2.2.)



The PP had provided the detailed description of SD contribution in the application submitted to Cambodian DNA, and this has been approved.

Comment on A.4.2.

The PP's response to the comment regarding the project category selected is reasonable.

Comment on B.3. (former B.3.1.)

The PP had made correction and added statement in the section explaining the normal practice of the host entity.

The PP's response to the comment requesting explanation on economic impact of the project is appropriate.

Comment on F.1. (former F)

The correction of the PDD made by the PP reflecting the comment is appropriate.

Comment on G.1. – G.3. (former G)

The PP had revised the PDD adding detailed explanation about the second stakeholder consultation conducted additionally.



5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Angkor Bio Cogen Rice Husk Power Project” in Cambodia. The validation was performed on the basis of UNFCCC criteria for small-scale CDM project activities and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to the Kyoto Protocol criteria and the small-scale CDM rules and modalities and the subsequent decisions by the CDM Executive Board.

The project activities consist of the construction of a rice husk firing CHP in order to generate electric power and steam to be consumed by the adjacent rice mill.

By burning the rice husk by-produced at the rice mill, the project results in reduction of CH₄ generation/emission from decayed rice husk. Besides, by displacing high carbon emission factor electricity currently consumed at the rice mill with electricity generated from a renewable source, the project results in reductions of CO₂ emissions. Those are real, measurable and give long-term benefits to the mitigation of climate change.

The project participant is Angkor Bio Cogen Rice Husk Power Co., Ltd. The project has been approved by the DNA of Cambodia on 19 January 2006. Project participant of Annex I Parties is not yet identified.

The indicative simplified baseline and monitoring methodologies, AMS Type I.A. and III E are appropriately applied. For diesel generation displacement, IPCC default value of 0.9 kg-CO₂e/kWh as defined by the methodology Type I.A. is used.

An analysis of the “technological barrier” and the “barrier due to prevailing practice” demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

Accuracy and correctness of the energy content data of biomass used for estimating the ex-ante project emission are properly addressed.

The validation team has received a confirmation by the host Party that the project activity assists it in achieving sustainable development.

The PDD was made publicly available on the DNV Climate Change website for comments by Parties, stakeholders and UNFCCC accredited NGOs from 15 June 2005 to 14 July 2005. One comment was received and the PDD was corrected and/or revised addressing the comments properly.

The local stakeholder consultation process was conducted and documented in the PDD according to the relevant authorities of the host Party. All comments received were positive and supportive to the project.



In summary, it is DNV's opinion that the "Angkor Bio Cogen Rice Husk Power Project" meets all relevant UNFCCC requirements for the small-scale CDM and all relevant host country criteria. Hence, DNV requests the registration of the project as a small-scale CDM project.



REFERENCES

Documents provided by the project proponent that relate directly to the project:

- /1/ SSC-PDD, Angkor Bio Cogen Rice Husk Power Project in Cambodia, 16 February 2005
- /2/ SSC-PDD, Angkor Bio Cogen Rice Husk Power Project in Cambodia, 12 April 2005
- /3/ SSC-PDD, Angkor Bio Cogen Rice Husk Power Project in Cambodia, 27 March 2006
- /4/ SSC-PDD, Angkor Bio Cogen Rice Husk Power Project in Cambodia, 31 July 2006
- /5/ List of comments and actions
- /6/ Host country approval letter, 19 January 2006 (The Kingdom of Cambodia)

Background documents related to the design and/or methodologies employed in the design or other reference documents:

- /7/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /8/ Appendix B of the simplified modalities and procedures for small-scale CDM project activities: *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*. Version 07: 28 November 2005.

Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:

- /9/ Masachika Suzuki, Analyst, Clean Energy Finance Committee, Mitsubishi Securities Co., Ltd.
- /10/ Kikuko Okada, Analyst, Clean Energy Finance Committee, Mitsubishi Securities Co., Ltd.
- /11/ Adisorn Chieu, Managing Director, Angkor Bio Cogen Co., Ltd. (ABC)
- /11/ Thy Sum, Manager, Chief of Climate Change Office, Department of Planning and Legal Affairs, Ministry of Environment
- /12/ Tin Ponlok, Ph.D., Deputy Director, Department of Planning and Legal Affairs, Ministry of Environment
- /13/ Thanakvara De Lopez, Ph.D., Senior Researcher, The Cambodian Research Centre for Development
- /14/ Toch Sovana, head of Renewable Energy Office, Department of Energy Technique, Ministry of Industry Mines and Energy (MIME)

APPENDIX A

VALIDATION PROTOCOL FOR SMALL-SCALE CDM PROJECT ACTIVITIES

Table 1 Mandatory Requirements for Small Scale Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference/Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12.2	OK	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art. 12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	CAR 1 OK	The sponsor and the host Parties have not yet approved the project. The DNA of Cambodia approved the project on 19 January 2006. Project participant of any Annex I Party is not yet determined.
5. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E.1 to E.4
6. Reduction in GHG emissions must be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	OK	Table 2, Section B.2.1
7. In case public funding from Parties included in Annex I	Decision 17/CP.7,	NA	Annex I Parties are not yet

Requirement	Reference	Conclusion	Cross Reference/Comment
is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	CDM Modalities and Procedures Appendix B, § 2		identified.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK	Cambodia designated the "Climate Change Office, Department of Planning and Legal Affairs, Ministry of Environment" as its tentative DNA in July 2003. There is no participating Annex I Party determined.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	OK	Cambodia is a Party to the Kyoto Protocol and ratified it on 22 August 2002. There is no participating Annex I Party determined.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	NA	There is no participating Annex I Party determined.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	NA	There is no participating Annex I Party determined.
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1

Requirement	Reference	Conclusion	Cross Reference/Comment
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	The PDD is in line with the template, SSC-CDM-PDD version 02.
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3, B and D Type I.A. and Type III.E.
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2, Section G
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section F Not required.
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD had been published on DNV website from 15 June 2005 to 14 July 2005.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A. Project Description The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/ /2/ /3/	DR	The project consists of two components and both can be qualified as a small-scale CDM project. <ul style="list-style-type: none"> Renewable fuel based electricity generation by the user of 2 MW in capacity < 15 MW Methane avoidance of 3729 tCO₂e/y direct emission < 15 kilotonnes-CO₂e/y 	-	OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/ /2/ /3/	DR	The two components of the project are categorised as small-scale CDM Type I.A and Type III.E respectively and not in the same project category.	-	OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	/1/ /2/ /3/	DR	-ditto-	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/ /2/ /3/	DR	The project's spatial boundary is clearly defined in the PDD. (B.4)	-	OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/ /2/ /3/	DR	The equipment that uses the electricity produced by the project activity is not clearly described to delineate the project boundary. <i>Refer to Table 3</i>	CL4	OK
A.2.3. Does the project design engineering reflect current good practices?	/1/ /2/ /3/	DR	The project will be the first rice husk burning power generation project in Cambodia. However the engineering to be employed is proven combustion technology for rice husk in South Asia.	-	OK
A.2.4. Will the project result in technology transfer to the host country?	/1/ /2/ /3/	DR	-ditto-	-	OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	/1/ /2/ /3/	DR	Angkor Bio Cogen Co., Ltd., a SPC for the project has plans to provide the necessary training defined and to make contract of operation and maintenance.	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/ /2/ /3/ /11/ /12/	DR I	SD criteria developed by the DNA of Cambodia are as follows: a) contribution to environmental protection b) social benefit to the neighbouring community c) technology transfer d) economic benefit Methane avoidance by the project is in line with the SD criteria a) and provision of electric power to the neighbouring community with a small charge is in line with the SD criteria b). <i>-It was verified during the DNA interview-</i>	-	OK
A.3.2. Will the project create any adverse environmental or social effects?	/1/ /2/ /3/ /11/ /12/	DR I	As the technology to be employed reflects modern and well-tested engineering practice, the project is not expected to create any adverse environmental nor social effect. <i>-It was verified during the DNA interview-</i>	-	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/ /2/ /3/	DR	The project is the first rice husk burning generation project in Cambodia and is in line with the SD criteria c), and the Cambodian government recognises that biomass is a promising energy source in "Cambodia's renewable energy strategy and plan" thus it's supposed to be in line with the SD criteria d).	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/11/ /12/	I	-This was verified during the DNA interview-		
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/ /2/ /3/ /11/ /12/	DR	-ditto- -This was verified during the DNA interview-	-	OK
B. Project Baseline The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	/1/ /2/ /3/	DR	Yes, the project falls under Type I.A version 07 (electric generation by user) and Type III.E version 07 (methane avoidance).	-	OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/ /2/ /3/	DR	The project consists of a rice husk power generation of 2 MWe by selling electricity to the rice mill and adjacent factories. In addition, methane fugitive avoidance by burning the rice husk that normally is left to decay.	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	/1/ /2/ /3/ /12/	DR	3 scenarios (alternatives to the project) on the options for disposal of rice husk are discussed as well. The “technological barrier” described on page 16 of PDD seems reasonable as this is the first case of a biomass-fired power generation technology in Cambodia. Among the discussion of the “investment barrier” presented on page 15 of PDD, the adequacy of chosen “project life of 20 years” is not explained in a transparent manner. <i>Refer to Table 3</i>	CL2	OK
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/ /2/ /3/	DR	The application of the baseline methodology SSC Type-III.E is appropriate. Average technical distribution losses (I) for electricity supply for neighbouring factories/communities are not discussed in the PDD. <i>Refer to Table 3</i>	CL3	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/ /2/ /3/ /10/ /11/ /12/ /13/	DR	The project is confirmed to be in line with the relevant national and/or sectoral policies. (PDD, A.2.2.) <i>-This was verified during the site visit interviews with interested parties-</i>	-	OK
B.2.4. Is the baseline selection compatible with the available data?	/1/ /2/ /3/	DR	All necessary data to be used for the baseline applied seem obtainable.	-	OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/ /2/ /3/	DR	Yes, methodology chosen is from paragraph 5 and 7 of Type I.A and paragraph 3 of Type III.E of Simplified Modalities and Procedures for Small-scale CDM Project Activities.	-	OK
C. Duration of the Project / Crediting Period It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	/1/ /2/ /3/	DR	Construction is planned to start in April 2006, and operation will start in April 2007. Expected operational lifetime is 21 years.	-	OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/ /2/ /3/	DR	Renewable crediting period with the first crediting period of 7 years.	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D. Monitoring Plan The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	/1/ /2/ /3/	DR	Monitoring methodology for category I.A version 07 (Electricity generation by the user) and III.E version 07 (Methane avoidance) of Appendix B of the simplified modalities and procedures for small scale CDM project activities are selected. Monitoring plan follows paragraphs 9 of I.A and 5 of III.E.	-	OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/ /2/ /3/	DR	Yes, given in D.3, page 19 of PDD.	-	OK
D.1.3. Is the application of the monitoring methodology transparent?	/1/ /2/ /3/	DR	Yes, given in B.2, page 14 of PDD	-	OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/ /2/ /3/	DR	Types of the measurement equipment are not clearly defined. <i>Refer to Table 3</i>	CL4	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/ /2/ /3/	DR	Yes, page 19 of PDD.		OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/ /2/ /3/	DR	Yes, both Q_{biomass} , and E_{biomass} are measurable.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/ /2/ /3/	DR	It is not clearly described whether the default value or measured value is to be used to determine the energy content of biomass. If the energy content is to be measured, measuring technique of the amount of biomass to minimize the effect of moisture contained in the biomass is not clearly described. Measurement methods and frequency of biomass energy content determination is not explained in the PDD. Otherwise, conditions of biomass storage will need to be verified on site visit. <i>Refer to Table 3</i>	CL5	OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/ /2/	DR	Yes, duration for archiving data is specified on page 19 of the PDD.	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/3/				
D.3. Monitoring of Leakage If applicable, it is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /2/ /3/	DR	Leakage is not applicable in this project.	-	OK
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/ /2/ /3/	DR	The electricity to be sold to the adjacent factories/communities is not clearly described in the PDD. <i>Refer to Table 3</i>	CL6	OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/ /2/ /3/	DR	-ditto-	CL6	OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/ /2/ /3/	DR	Measuring frequency seems reasonable. It is not clearly described how to ensure the objectivity of the measured data of electricity generated and consumed internally. <i>Refer to Table 3</i>	CL7	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/ /2/ /3/	DR	Measures and duration are described in PDD, D3 according to the guidance of SSC-PDD.	-	OK
D.5. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	/1/ /2/ /3/	DR	Angkor Bio Cogen Co., Ltd. (ABC) has authority and responsible to project management. (PDD. A.4.2.)	-	OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/ /2/ /3/	DR	It's not clearly described in the PDD. <i>Refer to Table 3</i>	CL8	OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/ /2/ /3/	DR	The training program is defined in the PDD, A.4.2 however training of monitoring personnel is not clearly identified. <i>Refer to Table 3</i>	CL9	OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/ /2/ /3/	DR	As it's a biomass power generation, unintended emissions in case of emergency are not supposed for the project.	-	OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/ /2/ /3/	DR	The types of the measurement equipment to be used are not clearly identified. (Same as D.1.4.)	CL4	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<i>Refer to Table 3</i>		
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/ /2/ /3/	DR	This is not clearly identified in the PDD. (Same as D.5.2.) <i>Refer to Table 3</i>	CL-8	OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/ /2/	DR	-ditto- <i>Refer to Table 3</i>	CL-8	OK
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/ /2/ /3/	DR	-ditto- (Same as D.5.3.) <i>Refer to Table 3</i>	CL-8	OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/ /2/ /3/	DR	If the energy content is to be measured, measuring technique of the amount of biomass to minimize the effect of moisture contained in the biomass is not clearly described. Measurement methods and frequency of biomass energy content determination is not explained in the PDD. (Same as D.2.3.)	CL-5	CL OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/ /2/ /3/	DR	This is not clearly identified in the PDD. (Same as D.5.2.) <i>Refer to Table 3</i>	CL-8	OK
D.5.11. Are procedures identified for project performance reviews?	/1/ /2/ /3/	DR	-ditto-	CL-8	OK
D.5.12. Are procedures identified for corrective	/1/	DR	-ditto-	CL-8	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
actions?	/2/ /3/				
E. Calculation of GHG emission It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
E.1. Project GHG Emissions The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/ /2/ /3/	DR	All project emissions defined by the monitoring methodology applied are captured appropriately.	-	OK
E.1.2. Have all relevant greenhouse gases and sources been evaluated?	/1/ /2/ /3/	DR	CH ₄ and N ₂ O are evaluated according to the monitoring methodology.	-	OK
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	/1/ /2/ /3/	DR	Yes.	-	OK
E.1.4. Are the calculations documented in a complete and transparent manner?	/1/ /2/	DR	Yes.	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/3/				
E.1.5. Have conservative assumptions been used?	/1/ /2/ /3/	DR	It's not clearly described how the values used in the calculations are determined, e.g. Q_{biomass} , E_{biomass} . <i>Refer to Table 3</i>	CL10	OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/1/ /2/ /3/	DR	If the energy content is to be measured, measuring technique of the amount of biomass to minimize the effect of moisture contained in the biomass is not clearly described. <i>(Same as D.2.3.)</i>	CL5	OK
E.2. Leakage It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/ /2/ /3/	DR	Leakage is not required by the methodologies applied.		OK
E.3. Baseline GHG Emissions The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries	/1/	DR	The equipment that uses the electricity produced	CL4	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
clearly defined and do they sufficiently cover sources for baseline emissions?	/2/ /3/		by the project activity is not clearly described to delineate the project boundary. (Same as A.2.2.) <i>Refer to Table 3</i>		
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/ /2/ /3/	DR	CH ₄ is captured as a baseline emission of methane avoidance and CO ₂ is captured as a baseline emission of biomass power generation respectively.	-	OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/ /2/ /3/	DR	Yes, the above gases are captured appropriately according to the baseline methodologies applied.	-	OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/ /2/ /3/	DR	Yes, baseline calculations are in line with the methodologies applied using the default values specified by IPCC.	-	OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/ /2/ /3/	DR	-ditto-	-	OK
E.3.6. Have conservative assumptions been used?	/1/ /2/ /3/	DR	Yes		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/ /2/ /3/	DR	Yes.	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.4. Emission Reductions Validation of ex-ante estimated emission reductions.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/ /2/ /3/	DR	Yes.	-	OK
F. Environmental Impacts It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/ /2/ /3/ /11/ /12/	DR I	No. EIA is not required for a power generation project less than 5 MW in capacity.	-	OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/ /2/ /3/ /11/ /12/	DR I	Emissions of SO ₂ , NOX and particulate are to be controlled by a combustion management system equipped, and those emissions are to be monitored according to the prevailing emission standards of Cambodia.	-	OK
F.1.3. Will the project create any adverse environmental effects?	/1/ /2/ /3/ /11/	DR I	This is a renewable power generation project employing a biomass fired boiler and a steam turbine. It's not supposed to create any adverse environmental effects.	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/12/				
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/ /2/ /3/	DR	Yes.	-	OK
G. Comments by Local Stakeholder Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/ /2/ /3/ /10/	DR	Yes. ABC conducted the first public consultation meeting on 18 September 2004 inviting twenty two local stakeholders, and the second public consultation meeting on 23 February 2005 inviting the chiefs representing 19 villages.	-	OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /2/ /3/ /10/	DR	The local stakeholder consultation process was carried out according to the advice from MINE and Ministry of Environment properly.	-	OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/ /2/ /3/ /10/	DR	-ditto-	-	OK
G.1.4. Is a summary of the comments received provided?	/1/ /2/ /3/	DR	All comments received are supportive to the project.	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/10/				
G.1.5. Has due account been taken of any comments received?	/1/ /2/ /3/ /10/	DR	There were no negative comments received on the project.	-	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1: The sponsor & the host Parties have not yet approved the project.	Table 1, Req. 4	The project was approved by the host Party on 19 January 2006.	OK
CAR 2: Statements regarding to CER issuance and allocation are not in the PDD.	Table 1, Req. 5	The modality of communication was signed by the host Party participant, Angkor Bio Cogen on 14 March 2006.	OK
CL 1: The equipment that uses the electricity produced by the project activity is not clearly described to delineate the project boundary, e.g. neighbouring factories and village.	A.2.2., E.3.1.	The PDD will be updated reflecting the comment of DNV.	OK The updated PDD /2/ was verified to describe the equipment in the project's boundary.
CL 2: Among the discussion of the "investment barrier" presented on page 15 of PDD, the adequacy of chosen "project life of 20 years" is not explained in a transparent manner.	B.2.1.	"Barrier due to prevailing practice" will be added, and the investment barrier will be withdrawn.	OK As there is no regulation for agricultural waste management in Cambodia, the rice mill will continue the current practice thus "Barrier due to prevailing practice" demonstrated is reasonable.
CL 3: Average technical distribution losses (<i>I</i>) for electricity supply for neighbouring factories/communities are not discussed in the PDD.	B.2.2.	The PDD will be updated reflecting DNV comment.	OK As diesel generation units are installed on-site of the rice mill, the distribution loss of the baseline deems to be zero.
CL 4: Types of the measurement equipment are not	D.1.4., 5.5	The PDD will be updated reflecting DNV comment.	OK Measurement equipment to be used

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
clearly defined.			are clearly described in the PDD, D.3.
CL 5: If the energy content is to be measured, measuring technique of the amount of biomass to minimize the effect of moisture contained in the biomass is not clearly described. Measurement methods and frequency of biomass energy content determination is not explained in the PDD.	D.2.3., 5.9., E.1.6.	The PDD will be updated reflecting DNV comment.	CL The measurement is to be periodically conducted at an independent laboratory. A data from a single measurement is not sufficient to demonstrate the stability and measurement frequency. OK The description stated in the PDD, A.4.2 demonstrated the appropriateness of the measurement.
CL 6: The amount of electricity to be sold to the adjacent factories/communities is not clearly described in the PDD.	D.4.1., 4.2.	The PDD will be updated reflecting DNV comment.	OK It's clearly described in the updated PDD that the only electricity supply to the rice mill is included in the project activities.
CL 7: It is not clearly described how to ensure the objectivity of the measured data of electricity generated and consumed internally.	D.2.3.	The PDD will be updated reflecting DNV comment.	OK ABC, a SPC for the project will be 25% of shares by ARM, an electricity user, however is thoroughly independent and electricity trading will be based on the commercial measurement equipment.
CL 8: Procedures necessary for the project management are not clearly described in the PDD.	D.5.2., 5.6.-5.8., 5.10.-5.12.	The PDD will be updated reflecting DNV comment.	OK Mr. Adisorn Chieu will be responsible for the operation of the project and will prepare the necessary procedure prior

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
			to the operation commencement. Besides one engineer and six operators will be assigned for the operation.
CL 9: The training program is defined in the PDD, A.4.2.3 however training of monitoring personnel is not clearly identified.	D.5.3.	The PDD will be updated reflecting DNV comment.	OK The training program will be provided by the person responsible. (refer to the above)
CL 10: It's not clearly described how the values used in the calculations are determined, e.g. Q_{biomass} , E_{biomass} .	E.1.5.	The PDD will be updated reflecting the DNV comment.	OK These values are described in the PDD, A.4.2.

- o0o -